

REMARKS/ARGUMENTS

Claims 1-30 are pending in the present application.

This Amendment is in response to the Non-Final Office Action mailed March 18, 2008.

In the Office Action, the Examiner rejected claims 16-30 under 35 U.S.C. §101; claims 1-3, 7-11, 15-18, 22-26, and 30 under 35 U.S.C. §102(e); and claims 5, 13, 20, and 28 under 35 U.S.C. §103(a). In addition, the Examiner indicated allowable subject matter for claims 4 and 12; and objected to claims 6, 14, 21, and 29 if they are rewritten in independent form including all of the limitations of the base claim and any intervening claims. Applicant has amended claims 16, 19, 23, and 27. Reconsideration in light of the amendments and remarks made herein is respectfully requested.

Rejection Under 35 U.S.C. § 101

In the Office Action, the Examiner rejected claims 16-30 under 35 U.S.C. §101 because the claimed invention is directed to non-statutory subject matter. Specifically, the Examiner contends that claims 16, 19, 23, and 27 are drawn to “instructions” *per se*, as recited in the preamble and as such represent non-statutory subject matter. The Examiner then states that no practical application functionality is realized (Office Action, page 4, paragraph 5). Applicant respectfully disagrees for the following reasons.

The rejected claims recite in part, “. . . a storage medium having instructions thereon which when executed cause a processor to perform operations” (emphasis added.) Accordingly, the instructions are not claimed without any other additional aspects. The instructions, when executed, cause a processor to perform the specified operations. In other words, the claims impart operations performed by a processor. Thus, they are not “instructions *per se*”.

However, to expedite the prosecution of the applications, claims 16, 19, 23, and 27 have been amended. Accordingly, Applicant respectfully requests the rejection under 35 U.S.C. §101 be withdrawn.

Rejection Under 35 U.S.C. § 102

In the Office Action, the Examiner rejected claims 1-3, 7-11, 15-18, 22-26, and 30 under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 7,216,079 issued to Barnard et al.

("Barnard"). Applicant respectfully traverses the rejection and submits that the Examiner has not met the burden of establishing a *prima facie* case of anticipation.

Barnard discloses a method and apparatus for discriminative training of acoustic models of a speech recognition system. A segment alignment data is cross-compared, segment by segment, to identify competing segments that induced a recognition error. When an erroneous segment is identified, acoustic models of the phoneme in the correct alignment are modified (Barnard, col. 3, line 64 – col. 4, line 11).

Barnard does not disclose, either expressly or inherently, at least one of: (1) calculating estimated weights for identified errors in recognition of utterances based on a reference string; (2) marking sections of the utterances as being misrecognized and associating the estimated weights with the sections of the utterances; and (3) using the weighted sections of the utterances to convert a speaker independent model to a speaker dependent model.

First, Barnard merely discloses identifying competing segments that induced a recognition error (Barnard, col. 3, line 64-65), not calculating estimated weights for identified errors in recognition of utterances based on a reference string. The segment alignment data merely represents boundaries of discrete acoustic segments (Barnard, col. 5, lines 18-19). Boundaries correspond to the alignment. They are not weights, which correspond to values or numbers. Furthermore, since competing segments are compared (Barnard, col. 8, lines 56-57), there is no reference string.

Second, Barnard merely discloses segmentation alignment representing at least one incorrectly recognized sequence of phonemes (Barnard, col. 6, lines 27-29), not marking sections of the utterances as being misrecognized, and not associating the estimated weights with the sections of the utterances. The segmentation alignment data is received from the recognizer (Barnard, col. 6, lines 24-25). There are no marking sections as being misrecognized. Furthermore, since there are no weights, there cannot be associating the estimated weights to the sections.

Third, Barnard merely discloses modifying the mean values by shifting the mean values of the wrong phoneme away from the acoustic feature vector used to score it and shifting the mean values of the correct phoneme toward from the acoustic feature vector used to score it and (Barnard, col. 6, lines 32-38), not using the weighted sections of the utterances to convert a

speaker independent model to a speaker dependent model. Computing the mean values of the acoustic models does not use the weighted sections. Furthermore, the process merely gradually converges on values that represent improved values (Barnard, col. 6, lines 41-43). Accordingly, there is no conversion of SI model to SD model.

To anticipate a claim, the reference must teach every element of the claim. “A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Vergegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ 2d 1051, 1053 (Fed. Cir. 1987). “The identical invention must be shown in as complete detail as is contained in the...claim.” *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ 2d 1913, 1920 (Fed. Cir. 1989). Since the Examiner failed to show that Barnard teaches or discloses any one of the above elements, the rejection under 35 U.S.C. §102 is improper.

Therefore, Applicants believe that independent claims 1, 8, 16, and 23, and their respective dependent claims are distinguishable over the cited prior art references. Accordingly, Applicants respectfully request the rejection under 35 U.S.C. §102(e) be withdrawn.

Rejection Under 35 U.S.C. § 103

In the Office Action, the Examiner rejected claims 5, 13, 20, and 28 under 35 U.S.C. §103(a) as being unpatentable over Barnard in view of U.S. Patent No. 6,253,181 issued to Junqua (“Junqua”). Applicant respectfully traverses the rejection and submits that the Examiner has not met the burden of establishing a *prima facie* case of obviousness.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. *MPEP §2143, p. 2100-126 to 2100-130 (8th Ed., Rev. 5, August 2006)*. Applicant respectfully submits that there is no suggestion or motivation to combine their teachings, and thus no *prima facie* case of obviousness has been established.

Furthermore, the Supreme Court in *Graham v. John Deere*, 383 U.S. 1, 148 USPQ 459 (1966), stated: “Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or nonobviousness of the subject matter is determined.” MPEP 2141. In *KSR International Co. vs. Teleflex, Inc.*, 127 S.Ct. 1727 (2007) (Kennedy, J.), the Court explained that “[o]ften, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.” The Court further required that an explicit analysis for this reason must be made. “[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *KSR* 127 S.Ct. at 1741, quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006). In the instant case, Applicant respectfully submits that there are significant differences between the cited references and the claimed invention and there is no apparent reason to combine the known elements in the manner as claimed, and thus no *prima facie* case of obviousness has been established.

Barnard discloses a method and apparatus for discriminative training of acoustic models of a speech recognition system, as discussed above.

Junqua discloses a speech recognition and teaching apparatus able to rapidly adapt to difficult speech of children and foreign speakers. A likelihood score ratio compares the likelihood score associated with correct recognition with the mean or average of the likelihood scores associated with incorrect recognition (Junqua, col. 4, lines 18-24). The ratio uses the Hidden Markov Model (HMM) (Junqua, col. 5, lines 35-45).

Barnard and Junqua, taken alone or in any combination, do not disclose or render obvious, at least one of: (1) calculating estimated weights for identified errors in recognition of utterances based on a reference string; (2) marking sections of the utterances as being misrecognized and associating the estimated weights with the sections of the utterances; (3) using the weighted sections of the utterances to convert a speaker independent model to a

speaker dependent model; and (4) calculating the estimated weights comprises computing an average likelihood difference per frame according to equation as follows:

$$Ln = \frac{H_L^n}{H_e^n - H_b^n} - \frac{R_L^n}{R_e^n - R_b^n} \quad \text{where } H_L^n \text{ is a log likelihood of hypothesis word n, } H_b^n \text{ is a}$$

beginning frame index (in time), and H_e^n is an end frame index, and R_L^n , R_b^n and R_e^n are counter parts for the reference string, as recited in claims 5 and 13.

As discussed above in the §102 rejection, Barnard does not disclose elements (1) - (3). Therefore, any combination of Barnard with any other reference in rejecting claims 5, 13, 20, and 28, is improper.

In addition, Junqua merely discloses the likelihood of observation given HMM model (Junqua, col. 5, lines 43-44), not an average likelihood difference per frame.

Furthermore, Junqua merely discloses a likelihood score ratio that compares the likelihood score associated with the mean or average of the likelihood scores associated with the incorrect recognition (Junqua, col. 4, lines 18-21). The likelihood ratio is the ratio between the likelihood score for correct recognition and the likelihood score for incorrect recognition (Junqua, col. 5, lines 26-30). In contrast, claim 5 recites the average likelihood difference (not ratio) per frame. The specific ratio in Junqua involves a tuning factor and a logarithm of a summation (Junqua, col. 5, lines 35-46). This ratio is different than equation (1) as recited in claim 5.

The Examiner failed to establish the factual inquiries in the three-pronged test as required by the *Graham* factual inquiries. There are significant differences between the cited references and the claimed invention as discussed above. Furthermore, the Examiner has not made an explicit analysis on the apparent reason to combine the known elements in the fashion in the claimed invention. Accordingly, there is no apparent reason to combine the teachings of Barnard and Junqua.

In the present invention, the cited references do not expressly or implicitly suggest any of the above elements. In addition, the Examiner failed to present a convincing line of reasoning as to why a combination of Barnard and Junqua is an obvious application of speaker adaptation using weighted feedback.

Therefore, Applicants believe that independent claims 1, 8, 16, and 23, and their respective dependent claims are distinguishable over the cited prior art references. Accordingly, Applicants respectfully request the rejection under 35 U.S.C. §103(a) be withdrawn.

Allowable Subject Matter

Applicants note with appreciation the Examiner's indication of allowable subject matter for claims 4 and 12. In addition, the Examiner objects to claims 6, 14, 21, and 29 as being dependent on a rejected base claim, but indicates that the claims would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. However, in light of the above amendments and remarks, Applicants respectfully request that independent claims 1, 8, 16, and 23, and all claims that depend therefrom be allowed.

Conclusion

Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Respectfully submitted,

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